EXPANDABLE CONTAINER

Technical field

The present invention relates to an expandable container-like housing which can be transported, for instance, to a suitable temporary erection site on a trailer. Such container-like housings can be used as mobile personnel carriages, toilets or service carriages. The present invention relates in particular to such container-like housings that can be expanded or extended telescopically so as to approximately double the volume of the container or even more.

Background of the invention

SE 447 143 (E04B 1/343) teaches a trailer-transported container-like telescopically retractable house construction that comprises a central main part from which there extend two telescopically extendable side parts which each include a ceiling structure and three side walls located on a respective side of the central main part, where in the compressed state of the container a first side part is intended to surround the central main part while the open side of the second side part is intended to surround both the central main part and the second side part. When the main part of the housing construction is in a retracted state, access is blocked partly by the foldable floor structure and partly by inwardly displaced walls, since the side walls mutually overlap and the long sides will be covered by the upwardly raised floor structure.

This blocked state constitutes a problem in certain instances, since access to the central main part is not possible in the collapsed or retracted state of the housing structure.

Object of the invention

With the intention of solving the aforesaid problem, the present invention provides a telescopically expandable container-like housing construction to which access is fully possible in the retracted state of the housing. When expanding such a housing structure, it is highly beneficial when assistance can be obtained from inside the housing structure such as to increase the speed of expansion.

Another object of the invention is to provide an expandable container-like housing structure, which is adapted for expansion in a manner that enables optimal sealing to be obtained between the components present in the module.

Disclosure of the invention

The aforesaid objects have been achieved and the aforesaid drawbacks have been eliminated by means of the present invention as defined in the independent Claims. Suitable embodiments of the invention are set forth in the dependent Claims.

The invention relates to an expandable housing structure that includes a door-mounted main module. The main module also includes heating, water and sanitation connections and fixed electrical installations. The housing structure also comprises an expansion module which includes a number of structural segments, including a ceiling part fixedly connected to a first wall part, a floor part, and two second wall parts. When expanding the housing structure, the floor part is intended to be swung out about a horizontal shaft mounted at the floor level of the main module. The first wall part together with the floor part together with the ceiling part are herewith adapted to be projected out telescopically from the main module. Furthermore, a second wall part is pivotally mounted about a vertical axle about which the second wall part is intended to be swung out subsequent to outwardly displacing the ceiling part and the first wall part, such as to form an additional wall to the expansion module. In this respect, the vertical axle, which consists of a hinge, is placed either at the edge of the first wall part or somewhere along the inner side surface thereof.

The second wall part is provided with locking means that are activated when connecting structural segments of the expansion module and/or the main module.

According to one advantageous embodiment, the second wall part is provided with an expandable seal along at least one of its edges. The seal is adapted to be expanded with air so as to abut one or more of the connecting structural segments. The seal is placed in an aluminium profile on the second wall part and may herewith extend around the full edge of the second wall part.

To enable access to the main module when the housing structure is loaded on a trailer for transportation, the door is placed in a wall plane in the main module parallel with the movement direction of the expansion module. Consequently, neither the first wall part covered by the raised floor structure nor the second wall part, which is folded to a position parallel with the first wall part will prevent access through the door.

Brief description of the drawings

The invention will now be described in more detail with reference to reference signs allotted to the accompanying drawings, in which

Figure 1 is a diagrammatic perspective illustration of a compacted housing structure according to the present invention;

Figure 2 is a diagrammatic perspective illustration of a partially expanded housing structure according to Figure 1;

Figure 3 is a diagrammatic perspective illustration of a fully expanded housing structure according to the present invention;

Figure 4 is a diagrammatic perspective illustration of an expanded housing structure according to Figure 3 with obscured lines shown in broken lines;

Figure 5 is a cross-sectional view of a fully expanded housing structure;

Figure 6 illustrates sealing means for a housing structure according to the invention; and

Figure 7 is a sectional view of the sealing means shown in Figure 6.

Description of the invention

Figure 1 illustrates a compacted expandable housing structure 1 ready for trailer transportation to an appropriate location. The main module of the housing structure includes an outer roof 3, an end wall 5 in which a door 7 is mounted, and a similar end wall on the opposite side of the door. The main module also includes a floor 8 in which holes 9 are provided for the application of lifting devices. The figure also shows a raised floor part 11 of the first expansion module of the housing structure, which in the shown position is inserted into the main module.

Figure 2 shows an intermediate position of the housing structure expansion, which in the case of this embodiment comprises a main module and

two expansion modules. In this illustration, the first floor part 11 has been moved down from the compacted position shown in Figure 1, about a horizontal axle 12 at floor level to form a floor structure in a first expansion module E_1, whereafter a first wall part 13 together with a roof part 21 fastened to the wall part are drawn telescopically out from the main module in the arrowed direction, across the lowered floor part 11. The figure also shows a lowered floor part 11 on the opposite side of the main module in preparation for projecting out a second expansion module E_2.

Figure 3 shows a fully expanded housing structure 1 according to one embodiment of the invention, where the first expansion module E_1 and the second expansion module E_2 are fully extended and where second wall parts 33 been swung out to correct positions by virtue of being pivotal about a respective vertical axle 35 mounted at respective side edges of the first wall part 13.

With the intention of clarifying the expansion sequence, there has been shown in Figure 4 an expanded body with obscured lines shown in broken lines, and in a position in which all other wall parts 33 are partially extended. The expansion sequence has here been shown with arrows, where the floor parts 11 are first extended and where the expansion modules E_1, E_2 are then drawn out telescopically over the floor parts so that, finally, the second wall parts 33 can be swung out. The figure also shows that the housing structure includes a window 42 opposite the door 7.

Figure 5 is a sectional view through the housing structure with the first expansion module extended, wherewith the roof part 21 of said module is provided with rollers that run in a rail in the main module. The wall part 13 is also provided with one or more rollers for rolling along the floor part 11 and therewith facilitate telescopic projection of the expansion module. The other expansion module is similarly designed to facilitate telescopic extension. When both modules are retracted, their respective ceiling of roof parts T_1, T_2 are accommodated in a space 51 formed between the roof 3 of the main module and its ceiling 53. The roof/ceiling parts thus overlap when the modules are inwardly withdrawn. As respective modules are extended, these roof/ceiling parts will slide down against a packing located in the main module and seal between the roof/ceiling part and the roof/ceiling part of the main module so as to prevent leakage. Further protection against leakage is obtained by virtue of the roof 3 overlapping the ceiling 53.

Figure 6 illustrates a pneumatic sealing element 61 which is adapted for use in sealing a housing structure of the aforedescribed kind, and then particularly as a seal between the second wall parts 33 and the remaining structural segments in the housing structure. The seal has an enclosed air-accommodating volume 63 which is intended to be filled and emptied respectively via an air valve 65. The valve is of the "car-valve" type, i.e. a spring-biased check valve that can be released with a centrally located pin.

As will be seen from Figure 7, the sealing element 61 includes a base plate 71 with which a sealing wall 73 is integrated in an airtight fashion, wherewith the air-accommodating volume 63 is formed between the base plate 71 and the sealing wall 73. The base plate 71 is fastened in an aluminium profiled rail 75 which, in turn, is fitted to the edge surfaces of the second wall part 33. The sealing element 61 is thereby secured mechanically to the wall part, although it can be readily replaced by twisting it away from the profiled rail. The material in the sealing element is a rubber material, preferably butyl rubber.

The above-described embodiment of a container-like housing structure enables access to the housing structure to be obtained in its compacted state, since there are no walls that prevent passage through either the door or the window.

It will be understood that the present invention is not limited to the illustrated embodiment, but that other embodiments are conceivable within the scope of the accompanying Claims. For example, the housing structure can be designed for expansion through a further step sideways using a corresponding expansion principle.
